

"Through Town and Jungle: Fourteen Thousand Miles Awheel among the Temples and People of the Indian Plain," by W. H. and F. B. Workman, illustrated; "British Bird Life," by W. P. Westell, illustrated; and "Gardening for the Million," by A. Pink.

Messrs. Whittaker and Co.'s announcements are as follow:—"Insulation of Dynamo Electric Machinery," by H. W. Turner and H. M. Hobart; "Armature Construction," by H. M. Hobart; "Steam Turbines," by H. M. Hobart and T. Stevens; "Concrete-Steel," by W. Noble Twelvetrees; "Practical Wireless Telegraphy," by Prof. Mazzotto, translated from the Italian by S. Bottone; "Percentage Tables for Elementary Analysis," by L. F. Guttman; and new editions of "The Alternating Current Circuit and Motor," by W. P. Maycock; "Electricity in its Application to Telegraphy," by T. E. Herbert; "Central Station Electricity Supply," by A. Gay and C. H. Yeaman; "The Management of Accumulators," by Sir D. Salomons; and "The Optics of Photography and Photographic Lenses," by J. T. Taylor, revised by P. F. Everitt.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

MR. GEORGE H. CARPENTER, of the Science and Art Museum, Dublin, has been appointed professor of zoology in the Royal College of Science for Ireland.

At the inaugural ceremony in connection with the University of Leeds on Thursday, October 6, the following honorary degrees, among others, will be conferred:—D.Sc., Lord Rosse, Lord Kelvin, Sir Isaac Lowthian Bell, Sir James Kitson, M.P., Sir William Henry Broadbent, Sir Arthur W. Rücker, Dr. Thorpe, C.B., Dr. C. G. Wheelhouse, Mr. Jonathan Hutchinson, Mr. J. P. Teal, Dr. H. Jackson, Prof. Miall, Dr. Tempest Anderson, and Prof. A. W. Mayo Robson.

THE inaugural lecture of the new session of the London School of Economics and Political Science will be given by the director, Mr. H. J. Mackinder, on Monday, October 3, on "The Need of Scientific Method in Affairs." The arrangements for the session include courses of lectures on all branches of economics, sociology, and cognate subjects of decided value in the development of a scientific spirit in commerce and industry. Among the lecturers are Mr. A. L. Bowley, Dr. E. Cannan, Mr. H. S. Foxwell, Prof. A. C. Haddon, Mr. A. W. Pollard, and Dr. E. A. Westermarck.

THE Department of Agriculture and Technical Instruction for Ireland proposes to establish for the year 1904-5 a limited number of commercial scholarships, tenable for one year only (value 100*l.* each), at such schools as the department may approve; also one scholarship for persons engaged in the woollen industry, and one for those engaged in the leather and tanning industries. These scholarships will be tenable at some higher institution, to be approved by the department, in which these industries are taught. They will be of the value of 80*l.* each, and may be renewable for second and third years at the discretion of the department. Candidates for the scholarships must apply for forms, which should be returned to the department duly filled in not later than October 5.

It is announced in the *British Medical Journal* that Lord Strathcona and Mount Royal, the Chancellor of McGill University, Montreal, has presented the sum of 10,000*l.* to the medical faculty. This is in addition to a gift of 20,000*l.* which Lord Strathcona made to the medical faculty about two and a half years ago. The whole of that sum was expended in alterations and extensions of the buildings of the faculty; these were so extensive that they practically amounted to rebuilding. Two new lecture rooms, and three laboratories for chemistry, physics, and hygiene respectively were erected, and other alterations and additions made which greatly increased the working power of the faculty. These buildings, which were opened by the Prince of Wales about two years ago, cost some 7500*l.* more than was expected. The further sum now given by Lord Strathcona is intended to cover the deficit and to assist the general work of the medical school.

NO. 1822, VOL. 70]

At University College, London, on October 3, Prof. Norman Collie will give a public introductory lecture to the faculty of medicine on "The Bearing of Chemistry on Medicine." On October 18 Sir William Ramsay will commence a course on the chemical aspects of the recent discoveries connected with radio-active matter. A course of lectures on spectroscopy and spectrum photography, by Mr. E. C. C. Baly, will be given twice during the session, beginning in November and February.

A LIST of courses of lectures and practical work at Herold's Institute—the London Technical School of Leather Manufacture—has been received. The school is a monotechnic equipped with every appliance requisite for the practical manufacture, currying, dyeing, and finishing of all kinds of leather. Students are urged to go through courses of study of two or three years' duration, and every possible facility is afforded to those who desire to carry out original researches.

THE syllabus of classes at the Sir John Cass Technical Institute, Aldgate, shows that much care has been devoted to the organisation of the work of the institute, which is now an educational centre for industrial classes, men and women, of east London. The institute has now completed its first two sessions, and a fairly definite line has been taken in the science teaching, which is chiefly concerned with physics, chemistry, and metallurgy, whilst these departments are correlated to the department of arts and crafts in respect to the teaching of art metal work, jewelry, and enamelling. Metallurgy is one of the more special departments of the institute, and we notice that a course is announced on metallography.

At St. Thomas's Hospital Medical School the entrance scholarship in natural science, of the value of 150*l.*, has been awarded to Mr. Ernest W. Withey, and the university scholarship, of the value of 50*l.*, to Mr. Charles E. Whitehead, of Caius College, Cambridge.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, July 26.—"On the Production of a Specific Gastrotoxic Serum.—Preliminary Communication." By Dr. Charles Bolton. Communicated by Prof. Sidney Martin, F.R.S.

This communication deals with the production of a gastrotoxic serum by the injection of the mucous membrane of the stomach (1) of the guinea-pig into the rabbit, (2) of the rabbit into the rabbit, and (3) of the guinea-pig into the guinea-pig.

In each case the blood of the injected animal becomes toxic; in the first case for the guinea-pig, in the second case for the guinea-pig, and in the third case for the rabbit.

The lesions produced by injection of the serum are in all three cases the same. They consist of circumscribed areas of necrosis in the mucous membrane of the stomach associated with haemorrhage, the latter being secondary to the necrosis, and to some extent also of haemolytic origin. At a later stage definite ulcers of the stomach are produced, and in this process of ulceration the gastric juice is considered to play a prominent part. The remaining portions of the alimentary canal are found to be normal. The gastrotoxic serum does not produce any visible change in the stomach cells which are exposed to its action *in vitro*.

An inquiry into the nature of the gastrotoxin has shown that it consists of an "immune body," which is newly formed in the blood and resists the action of heat, and a "complement" which is contained in the normal blood and is destroyed by heat.

The specificity of the gastrotoxin was tested by mixing various cells (such as liver, blood) with it previous to its injection in order to determine whether guinea-pig's stomach cells alone, or whether any other cells, could extract the "immune body." As the result of this, it was found that guinea-pig's stomach cells alone in the first two cases were able completely to extract the "immune body" and thus

render the serum inactive. It was, however, found, on immunisation of a rabbit against guinea-pig's stomach cells washed quite free from blood, that the haemolytic power of the rabbit's serum for guinea-pig's red blood corpuscles was much increased, and therefore that the gastric cells possess receptors to some extent in common with red blood corpuscles. The gastrotoxin is thus shown to consist of two factors:—(1) gastrotoxic, (2) haemolytic.

The haemolytic factor is by no means the more important, because the lesions produced were in the hitherto observed cases limited to the stomach, the haemolytic factor could be extracted from the serum leaving the gastrotoxic factor, and in many cases no evidence of haemolysis could be found on microscopic examination of the lesions.

In the case of the gastrotoxic serum produced by injection of the stomach cells of the rabbit into the rabbit, it was found that although the rabbit's stomach cells possessed an affinity for the gastrotoxin, yet they completely failed to extract the "immune body" when exposed to the action of the serum *in vitro*. It is therefore concluded that probably this phenomenon, together with absence of autolysis, may be explained by the presence of an "anti-immune body" which is concomitantly formed by the rabbit to protect itself from the effects of the poison which it is manufacturing.

This opens up a hitherto unexplored field in the pathology of human gastric ulcer.

PARIS.

Academy of Sciences, September 19.—**M. Mascart** in the chair.—On the production of sugar in the kidney of a dog to which phloridzin has been administered: **R. Lepine** and **M. Boulud**. It is shown that the sugar obtained in experiments in glass does not give an exact measure of the sugar actually present in the blood in the veins.—On the depth of field and focal length of photographic objectives: **J. Thovert**. Regarding the object of photography as the reproduction of an object as seen by the eye, the limit of angular definition of a photographic image should be about 1/3000. It is shown that this ideal cannot be attained for lenses of short focal length.—On the chemical composition and formula of adrenalin: **Gabriel Bertrand**. Three formulæ have been proposed for adrenalin, the active substance in the extract of suprarenal capsules. Starting with 118 kilograms of the fresh organs, from 4000 horses, 125 grams of crystallised adrenalin were obtained, and this was submitted to an elaborate fractional precipitation. The figures obtained by combustion analyses of the various fractions were very concordant, and show that crystallised adrenalin extracted from the suprarenal capsules of the horse is a distinct substance and not a mixture. The molecular weight was fixed by the lowering of the freezing point of glacial acetic acid, and the formula of the substance fixed as $C_9H_{13}NO_3$, this agreeing with the views of Aldrich.—The nomenclature of the rosanilines: **Jules Schmidlin**.—Tetraoxycyclohexane-rosanilines: a new class of colourless derivatives: **Jules Schmidlin**. The formation of this new class of compounds depends on a simple hydrolysis which rosaniline salts undergo in acid solution. The conclusion is drawn from these experiments that the salts of rosanilines contain four double linkages of the fatty type.—Ultramicroscopic observations on solutions of pure glycogen: **Wilhelm Blitz** and **Madame Z. Gatin-Gruzewska**. Two sets of experiments are described. The first set, agreeing with the results of Raehlmann, show that an aqueous solution of glycogen contains particles of different diameters, varying with the condition of the solutions. In the second set, the effect on the size of the particles by precipitation with gradually increasing quantities of precipitants was studied.

NEW SOUTH WALES.

Royal Society, August 3.—**Mr. C. O. Burge**, president, in the chair.—On Eucalyptus kinos, their value for tinctures, and the non-gelatinisation of the product of certain species: **H. G. Smith**. In this paper, which is the second of the series dealing with Eucalyptus kinos, the author shows that the tannins in the exudations from the various Eucalypts vary largely in character, and that while some kinos gelatinise in tinctures, others do not. There is a remark-

able regularity in the action of kinos from allied species, and the marked differences in the tannins themselves appear to be the reason why they act so differently as regards gelatinisation. There are three tannins at least in Eucalyptus kinos, and all are determinable by reagents.—On some hydrographical data in relation to ocean currents: **H. A. Lenehan**. A paper dealing with ocean drifts, principally in the southern hemisphere. It contains a tabulated statement of 182 records, the most important of which travelled a distance of 11,350 miles between June 19, 1901, and March 5, 1904, at a daily rate of 11½ miles. There are also eleven other drifts more than 3000 miles long. Two charts accompany the paper, showing the positions where the records were cast adrift and the places where found.

GÖTTINGEN.

Royal Society of Sciences.—The *Nachrichten* (physico-mathematical section), part iv. for 1904, contains the following memoirs communicated to the society:—

July 9.—**W. Nernst**: On the formation of nitrogen dioxide at high temperatures. **H. Gerdien**: Measurements of atmospheric electricity during two balloon ascents. **Wilhelm Blitz**: Ultra-microscopic observations, i. The precipitation of sulphur from thiosulphuric acid and of selenium from selenious acid.

June 25.—**H. Minkowski**: On the closest possible parallelopipedal piling of congruent solids.

July 23.—**Eduard Riecke**: Researches on the phenomena of discharge in Geissler tubes, i. On the exhaustion of Geissler tubes by the electric current.

CONTENTS.

PAGE

Petroleum	525
Chemistry of Alkaloids. By W. P. W.	526
Nickel Steels. By A. McW.	526
Our Book Shelf:—	
Besson: "Le Radium et la Radioactivité"	527
Macnair: "Chemical Laboratories for Schools"	528
Maclean: "Photo Printing"	528
Valentiner: "Œuvres scientifiques de L. Lorenz"	528
Thomson: "Botany Rambles"	528
Letters to the Editor:—	
Average Number of Kinsfolk in each Degree.—Dr. Francis Galton, F.R.S.	529
The Mendelian Quarter.—Prof. Karl Pearson, F.R.S.	529
The <i>n</i> -Rays.—Prof. R. W. Wood	530
Porpita in the Indian Seas.—Nelson Annandale	531
On van 't Hoff's Law of Osmotic Pressure.—Geoffrey Martin	531
The Royal Photographic Society's Annual Exhibition	532
Prof. N. R. Finsen	532
Notes	533
Our Astronomical Column:—	
Astronomical Occurrences in October	536
Explanation of the Martian and Lunar Canals	536
Further Observations of the Recent Perseid Shower	536
Position of Saturn's Ninth Satellite	536
Distribution of Nebulae in Relation to the Galaxy	536
Astronomy and Cosmical Physics at the British Association. By Dr. William J. S. Lockyer	536
Zoology at the British Association	538
Geography at the British Association. (Illustrated.)	541
Conference of Delegates of Local Scientific Societies	542
Eocene Whales. By R. L.	543
Forthcoming Books of Science	544
University and Educational Intelligence	547
Societies and Academies	547